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Abstract

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INSTRUCTIONAL OBJECTIVES FOR A JUNIOR COLLEGE COURSE IN PHYSIOLOGY (FIRST SEMESTER)

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JC 690 424

PHYSIOLOGY OBJECTIVES: SET # 1

V. Organization of the Units of Instruction.

Except where noted, all specific objectives apply to both the lecture and lab.

1. Orientation: cell and tissue.

The student will gain a knowledge and understanding of protoplasm, cell processes, tissue, movement of material at cellular levels, enzymes, and control of tissue activity.

a. (lecture) The student will demonstrate his knowledge of the typical animal cell by identifying in writing the names of the structures within a given diagram of a cell. Arrows will point to the structures to be identified and the student will write the names at the end of the arrows with 90% accuracy.

b. (Lecture) In a written test the student will define "protoplasm" and name in writing the five basic compounds found in protoplasm. 80% accuracy required.

c. The student will name in writing the three major classes of organic compounds found in biological matter with 100 % accuracy.

d. The student will differentiate between inorganic and organic compounds in a short paragraph not exceeding 100 words. This should be based on the notes from lectures and should include at least five points of difference.

e. (Lecture) The student will list in writing the four physiological properties of protoplasm and define each with 60% accuracy.

f. (Lecture) The student will define catablism and anabolism and show by example how the two can be related in human metabolism. 50% accuracy required.

g. The student will define in writing at least two of the following three terms (correctly): ingestion, digestion, and absorption.

h. The student will name in writing the parts that compose an atom of matter indicating where appropriate the electrical charge of the parts and the atomic weight with 80% accuracy.

i. Given a list of abreviations of common chemical elements, the student will put in writing which ones can form negative or positive ions. 70% accuracy required.

j. (Lab) Given the basis for the electrolyte-non-electrolyte theory, the student will construct a paragraph of not more than 8 sentences telling at least 4 reasons why acids can be weak or strong and give an example of a strong acid and a weak acid with 50% accuracy.

k. (Lab) The student, given a hypothetical curve for a buffer considered to be initially mediumly acidic and being titrated with a strong base having a pH of 12, will indicate on the curve where the buffer is effective, where it loses its effectiveness, the point of saturating and tell in writing the final pH. 80% accuracy required.

l. The student will tell in three written sentences the 2 reasons why reactions (biological) utilize enzymes while chemical ones don't. 50% accuracy.

m. (Lecture) The student will demonstrate his knowledge of the various types of epithelial tissue by lableing given diagrams of four types of epithelial tissue with 75% accuracy.

n. (Lecture) The student will name in writing the four functions of epithelial tissue with 75% accuracy.

o. (Lecture) The student will answere with 70% accuracy ten fill-in type questions dealing directly with connective tissue.

p. (lecture) The student will name in writing at least 4 functions of connective tissue and will give an example from the human body for each of the four functions named (75% accuracy required).

q. On a written test the student will define and differentiate the following terms: osmosis, diffusion, filtration, and active transport. Three of the four must be done correctly.

r. (Lab) Given a list of ten differnet solutions of variable concentration, the student will put down in writing which ones are isosmotic, isotonic, both, or neither as compared to a human R.B.C. with 60% accuracy.

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2. The muscle system.

The students will gain a knowledge and understanding of the muscle system, including its anatomy (microscopic), activity, and function.

a. (Lab) Given a graph of a muscle being electrically stimulated, the student will indicate on the graph at least five of the following phenomenon: summation of twitches, summation of stimuli, treppe, incomplete tetanus, complete tetanus, and fatigue.

b. (Lab) The student will describe by appropriately labeled graphs any four responses of a muscle as the rate of stimulation is increased from 1 per second to 100 per second. Assume voltage to be maximal. 75% accuracy required.

c. In four written sentences the student will describe the one reason that would differentiate "maximal" and "supermaximal" as used to describe the strength of the stimulus and contraction. 70% accuracy required.

d. (Lecture) Given a list of 20 properties of muscle, the student will with 80% accuracy put in writing next to the listed properties whether they apply to smooth, skeletal, or cardiac muscle.

e. (lecture) The student will write two defining sentences for each of the following terms: sarcoplasm, myofivril, sarcomeres, motor unit, motor end plate. 60% accuracy required.

f. The student will in writing name the three fundamental characteristics of a muscle stimuli with 67% accuracy required.

g. (Lecture) Given three partially completed chemical equations to explain the relationships of ATP, ADP, CP, and C in muscular contraction, the student will complete them in writing with 60% accuracy.

h. The student will define and differentiate between "isotonic" and"isometric" types of contractions in less than five sentences with 85 %accuracy.

i. The student will give in writing at least 2 reasons why the previous degree of muscls stetching enables the muscle to do more work. 50% accuracy required.

j. In a written test the student will differentiate between aerobic and anaerobic phases of muscle activity being sure to discuss four important differentiating points of the two phases. 75% accuracy required.

3. The nervous system.

The student will gain a knowledge and understanding of the nervous system, including the gross and microscopic anatomy, its activity, and function.

a. Given a list os six sentences, the student will pick out the one which most clearly defines the following three closely related terms: injury, action, and resting potentials. 67% accuracy required.

b. Given a series of fill-in types questions, the student will with 70% accuracy name the two ions resposible for maintaining the resting potential.

c. The student will define and describe the all or none response as it applies to nerve physiology. Three of the importnat points talked about in lecture must be described.

d. The student will define in writing a series of four nerve physiology terms with 75% accuracy.

e. (Lab) The student will in writing define and give one example of the law of specific nerve energies with 90% accuracy.

f. (Lecture) The student will describe in writing and by diagram the flow and/or position of ions across the nerve membrane prior to stimulation, at the time of depolarization, and immediately following depolarization with 60% accuracy.

g. The list in writing 6 of the seven differences as given in lecture between the central and autonomic nervous systems.

h. The student will, on a matching test of ten items, match the anatomical or physiological structure or phenomenon of the eye with 80% accuracy.

i. The student will define in writing the following related terms: emmetropic, hypertropic, myopic, and astigmatic.

j. (Lecture) Given the outline of the human brain cerebral hemispheres and a list of ten anatomical features or areas of it, the student will label the outline with these ten features with 70% accuracy.

k. (Lecture) With 67% accuracy the student will tell in writing where three given nuclei are located in the brain and with 50% accuracy the brain areas that each of these nuclei connect.

l. (Lecture) Given a set of true and false questions dealing with the function of the cerebellum, the student will answer 70% of them correctly.

m. (Lecture) The student will define in writing a conditioned reflex and on the basis of what was given in lecture explain it with 70% accuracy.

4. The circulatory system.

The student will gain a knowledge and understanding of the circulatory system, including some anatomy, vasom motor control mechanisms, hemodynamics, function and physiology of the blood.

a. (Lecture) The student will trace a heartbeat from its point of origin in a specialized part of the right auricle to its end point in the Purkinje fibers, naming in writing the initial point and all structures and fibers between there and the Purkinje fibers with 80% accuracy.

b. On the basis of what was given in class, the student will define and/or explain the following terms as they relate to the heart with 75% accuracy: myogenicity, refractory period, all or none law, and Starling's Law.

c. (Lab) Given a normal human EKG, the student will label one heartbeat with the appropriate letters with 75% accuracy and explain what the four curves represent in terms of the heartbeat with 80% accuracy.

d. Given a cross-sectional diagram of the human heart with arrows drawn to various areas and structureds composing the heart, the student will write the appropriate name at the end of each arrow with 90% accuracy.

e. (Lab) The student will name in writing with 75% accuracy the four reasons that enable blood to flow back to the heart via the veins.

f. (Lecture) Using the class lecture as a basis, the student will name and explain(in 5 sentences or less) the 5 neural mechanisms for vasomotor control. 60% accuracy required.

g. (Lecture) The student will name in writing the three primary mechanisms that control arterial pressure with 67% accuracy.

h. (Lecture) Given three partially completed mathmatical-like equations explaining blood flow, the student whill complete them with the appropriate word or phrase with 70% accuracy.

i. (Lab) The student will name the four basic chemical sompounds or elements necessary for a blood clot to form with 75% accuracy.

j. (Lecture) The student will define and note differences where necessary among the following terms: clotting, agglutination, antibody, and antigen. 75% accuracy required.

k. (Lecture) Given two columns of ten item each p pertaining to blood, the student will match the items in column 1 with the items in column 2 with 90% accuracy.

5. The respiratory system.

The student will gain a knowledge and understanding of the human

a. Given a drawing of the human respiratory apparatus and associated structures and a series of arrows pointing to various part of the drawing, the student will write the appropriate names at the end of each arrow with 90% accuracy.

b. (Lecture) Given the names of the parts of the respiratory system(including atm. and blood vessels),the student will write next to each name the approximate O_2 and CO_2 pressure as given in the textbook with 90% accuracy.

c. (Lab) The student will name in writing the 5 subdivisons of lung air and define each with 70% accuracy.

d. (Lecture) Given the normal O_2 dissociation curve for hemoglobin, the student will label the two axis appropriately, construct O_2 dissociation curves for fetal hemoglobin and hemoglobin under CO_2 pressure and identify the position on the normal curve where dissociation occurs at the tissue level with 70% accuracy.

e. (Lecture) The student will name in writing the five systems for neural control of respiration and explain each on the basis of what was covered in lecture. Each explanation limited to 60 words max. 60% accuracy required.

f. The student will list in writing the names(types) and location, as well as cause and result of the stimulation of the receptors invovlved in respiratory control with 60% accuracy.

g. The student, given a diagram of the RBC contained within a capillary at the tissue level, will identify the five means of O_2--CO_2 transport by writing where appropriate in the diagram a chemical equation to indicate each means. A diagram of the chloride shift should also be included. 75% accuracy required.

6. The digestive system.

The student will gain a knwoledge and understanding of the human digestive system, including the anatomy, function, enzymes of and process of metabolism.

a. (Lecture) On a written exam, the student will define "digestion" and "hydrolysis" and equate the two terms with 90% accuracy.

b. On a fill-in type question dealing with anatomical and physiological features of the digestive system, the student will write in the appropriate one word answerewith 80% accuracy.

c. (Lecture) Given a list of various parts of the digestive system the student will write out 3 funciton for each. 75% accuracy required.

d. Given a list of enzymes that occur in the difestive tract, the student will for each write next to each the specific area of the digestive system where it is found and its function. 70% accuracy required.

e. (Lab) The student will name 6 qualitative chemical test with at least 4 of them dealing with carbohydrates and tell for each what a positive and what a negative result indicates with 70% accuracy.

f. The student will explain the chemical control of gastric sec retion, pancreatic secretion and bile secretion by identifying for each in writing the name of the hormone involved, the origin of the hormone, the causitive factor in the hormones release and the effect of each hormone. 75% accuracy required.

g. The student will define in writng: aatabolism, anabolism and metabolism and calorie. 75% accuracy required.

h. The student will identify by name, in writing, the end products of CHO, fat, and protein digestion with 90% accuracy.

i. (Lab) The student will name in writing the 5 basic factors thatcan effect BMR, as well as the 4 factors that influence TMR, both with 75% accuracy.

j. (Lab) The student will identify in writing the two ways of determing BMR with 100% accuracy.

k. (Lab) Given a rat's O_2 consumption in ml./min., the student will show in writing how to calculate the rat's normal BMR in Calories/day. 70% accuracy required.

7. The excretory system.

The student will gain a knowledge and understanding of the excretory system, with special reference to the structure and function of the human kidney.

a. The student will define the following terms as they pertain to the formation of urine: filtration, reabsorption, tubular secretion. The answers will be written and done with 67% accuracy.

b. (Lab) Given a diagram of the human kidney and a list of the anatomical structures composing it, the student will draw an arrow from each named structure to the proper part of the diagram with 80% accuracy.

c. (Lecture) The student will distinguish between the following terms by defining them in two sentences each: secretion, excretion, and eliminantion. 67% accuracy required.

d. Given a diagram of a nephron and a list of compounds that are involved in urine formation, the student will write the name of the compounds in the appropbiate part of the nephron area and indicate by an arrow for each the direction of flow with 60% accuracy. Also label each arrow with the name of the manner of flow involved with 70% accuracy.

8. Reproduction.

The student will gain a knowledge and understanding of the reproductive system of the human, including the hormones involved, the anatomical features, functions of the gonads and the menstrual cycle.

a. In a series of fill-in types questions dealing with anatomy-physiology of the female and male reproductive tracts, the student will fill in the blanks with the appropriate one word answer with 80% accuracy.

b. (Lab) Given the names of the various phases of mitosis, the student will sketch a cell and the changes occuring in the nucleus for each of the named phases. Stress is on position and shape of chromosomes, spindle and centriole. 60% accuracy required.

c. The student will name in writing 3 functions of the testis and 2 functions of the ovary with 80% accuracy.

9. The endocrine system.

The student will gain anknowledge and understanding of the endocrine system, including names of endocrine glands, the hormones secreted, actions of hormones, and results of malfunctioning endocrine glands.

a. Given a partially completed table consisting of names of glands, the hormone secreted, and the action of the hormone, and given a list of lettered names of glands, hormones and actions of hormones, the student will complete the table by filling in the blanks with the appropriate letter with 80% accuracy.

b. (Lecture) Given a list of names of hyper- and hypo-secreting endocrine glands, the student will write a statement for each identifying the disease condidtion that results from said malfunction with 60% accuracy.

c. (Lecture) The student will name the hormones secreted by the pituitary and the function of each in writing with 65% accuracy.

PHYSIOLOGY OBJECTIVES: SET # 2

SPECIFIC OBJECTIVES:

1. In class the student will write a brief definition of the following: cell, tissue, organ, organ system. Five minutes will be allowed to complete the task.

2. In the laboratory a number of projectuals will be shown. The student will indicate on the answer sheet whether the projection is a cell, a tissue, an organ, or an organ system. The task will take five minutes.

3. The instructor will point out a number of structures on the model of the human. The student will indicate his understanding of directional terms by specifying the position of one structure with relationship to another structure. Ex. The head is superior to the shoulder. The task will take ten minutes. The student is expected to get a minimum of twelve correct.

4. Given a diagram of the outline of the human torso, the student will draw broken lines to indicate the following planes: sagittal; coronal; transverse. He will then label the plane. The exercise will be allowed five minutes and 100% accuracy is expected.

5. The instructor will illustrate five body positions. The student will indicate on a slip of paper which of the positions demonstrates the anatomical position. Five minutes will be allowed for the exercise. A slip of paper with five numbers is furnished--encircle the correct number. 100% of the class will choose the correct answer.

6. Outside of class the student will write a brief definition (not more than three lines) of the following terms: survival; homeostasis; interstitial fluid; blood plasma; metabolism; anabolism; catabolism; integration. Use any references desired.

SPECIFIC OBJECTIVES:

1. Outside of class the student will write a paper of between 150 and 300 words on protoplasm. Paper to include constituents; form; appearance; characteristics.

2. Given a kit the student will construct a "typical" cell. He will attach appropriate labels furnished with the kit to each part represented. He will then list at least one function of each part. The exercise will be completed in the laboratory within twenty minutes.

3. Given diagrams of several systems, the student will indicate the following: (1) solute movement (2) solvent movement (3) movement of solute and solvent (4) process of movement involved (5) net exchange of substances. The task will be completed under test conditions within fifteen minutes.

SPECIFIC OBJECTIVES:

1. Twenty microscopes with tissue slides will be set up in the laboratory. Each student will visit each microscope for one minute and identify the tissue. Write your answer on the lab sheet provided. The student is expected to identify at least seventeen tissues correctly.

2. Given a list of tissues, the student will give the characteristics of the tissue; the location of the tissue; and at least one function of the tissue. The task will be completed outside of class.

3. Given diagrams of five types of tissue, the student will label those parts indicated. The task will be completed in the laboratory in thirty minutes under test conditions.

4. Twenty slides will be projected. The student will identify the tissues by writing the name on the sheet provided. The task will take twenty minutes.

SPECIFIC OBJECTIVES:

1. Given a diagram containing several membranes, the student will name the membranes indicated and classify as to mucous; serous; synovial. The task will be completed in the laboratory in ten minutes.

2. A slide of the cross section of the human skin will be projected by the instructo r. A number of parts will be pointed out. The student will write the names of the parts on the sheet provided. After the projection is removed, the student will give at least one function of each part named. The exercise will consume fifteen minutes.

3. Several slides of glands will be projected by the instructor. The student will identify the kind of tissue in the gland and will classify the gland as exocrine or endocrine. The task will take five minute s.

SPECIFIC OBJECTIVES:

1. Using an articulated skeleton the instructor will indicate a number of bones. The student will write the name of the bone indicated under test conditions. The exercise will take thirty minutes.

2. The instructor will point out a number of structures on a projected slide of a cross section and a longitudinal section of bone tissue. The student will write the names of the parts indicated. The exercise will take ten minutes in the laboratory.

3. Given a group of bones, the student will classify them as to shape. The exercise will be completed in the laboratory in ten minutes.

4. Given a long bone with specific structures numbered, the student will write the name of the structure indicated. The exercise will be completed in the laboratory in five minutes.

5. Using a "box of bones" the instructor will indicated a number of processes, depressions, and openings. The student will write the name of the structure indicated. The task will take fifteen minutes and will be completed in the laboratory.

6. Given a diagram of the skull at birth with a number of structures indicated, the student will label those structures under test conditions in ten minutes.

7. Using a dissected beef joint, the instructor will indicate a number of structures. The student will write the names of the structures indicated in the laboratory in ten minutes.

8. Outside of class the student will give nine changes that take place in the skeleton as the individual increases in age. References may be used (see text).

9. The instructor will illustrate a number of joint movements under test conditions. The student will write the name of the type of movement. The task will take fifteen minutes.

10. The instructor will point out a number of kinds of joints. The student will write the name of the joint in the laboratory and the exercise will be allowed fifteen minutes.

SPECIFIC OBJECTIVES:

1. Under test conditions, the student will list three functions of the muscular system. Five minutes will be allowed.

2. Under test conditions the student will list four characteristics of muscle tissue and write a one sentence definition of each characteristic. Ten minute s will be allowed.

3. Given a number of kymograph records, the student will label the graphs of muscle contraction as to the kind of contraction. The task will be completed in the laboratory in fifteen minutes.

4. Given a list of muscles the student will indicate the origin, insertion, action, and innervation of each. The task will be completed under test conditions in thirty minutes.

5. The instructor will indicate a number of musdles on the torso in the laboratory. The student will write the name of the muscle. The task will take fifteen minutes.

SPECIFIC OBJECTIVES:

1. The instructor will project a microscope slide of nerve tissue. The student will identify the kinds of cells pointed out by the instructor by writing the name of the kind of cell. The task will be completed in the laboratory in fifteen minutes.

2. Under test conditions the student will write a one sentence definition of the following based on function: sensory neuron; motoneuron; interneuron. The task will be allowed five minutes.

3. Given diagram of three types of neurons based on structure the student will indicate the type of neuron under the diagram. The task will be completed in the laboratory in five minutes.

4. Given a detailed diagram of a neuron, the student will label all parts indicated. The task will be completed under test conditons in ten minutes.

5. Outside of class the student will write a paper on the functions of neurons. The paper will be between 300 and 500 words. Use any references desired.

6. Outside of class the student will write a paper on the conduction of an impulse by a nerve. Paper to include initiation; course; rate; across synapses; across neuromuscular junctions. The paper will be between 800 and 1100 words. Use any references desired.

7. Given a diagram of the human brain and spinal cord with membranes, the student will label the membranes and spaces of the brain and spinal cord indicated. The task will be completed under test conditons and will be allowed thirty minutes.

8. Outside of class the student will write a paper on cerebrospinal fluid. Paper to include constituents, productions, functions; and locations of fluid. The paper will be between 500 and 750 words.

9. The instructor will point out a number of structures on a very large model of the brain. The student will write the name of the parts indicated. The task will be completed under test conditions in 30 minutes.

10. Given a list of parts of the human brain the student will list at least one function for each part. The task will be completed under test conditions in fifteen minutes.

11. Under test conditions the student will list six main divisions of the human brain. The task will take fifteen minutes.

12. Given a diagram of a cross section of the spinal cord, the student will label all parts indicated. The task will take thirty minutes and will be completed in the laboratory.

13. Given a list of cranial nerves the student will indicate functions of each. The task will be completed under test conditens in one hour.

14. Outside of class the student will write a paper of between 750 and 1000 words on a reflex action of his choice. Include these items which you feel necessary for understanding by the instructor.

15. Outside of class the student will write a paper on the autonomic nervous system. The paper will be between 1500 and 2000 words and will include definition; divisions; macroscopic structure; microscopic structure; principles of action.

SPECIFIC OBJECTIVES:

1. Given a list of sensations the student will write the receptors receiving the stimuli. The task will be completed under test conditions in ten minutes.

2. Given a diagram of the eye the student will label all parts indicated. The task will be completed in thirty minutes in the laboratory.

3. Using a model of the auditory apparatus the instructor will point out a number of structures. The student will write the names of the parts indicated and list at least one function of each part. The task will be completed in 20 minutes in the laboratory.

4. Outside of class the student will write a paper of between 700 and 1000 words on the physiology of vision. Paper to include formation of the retinal image; stimulation of the retina; conduction of the image to the visual area of the brain. Use any references desired.

5. Under test conditions the student will write the names of the kinds of taste buds located on the tongue. The task will be completed in ten minutes in the classroom.

SPECIFIC OBJECTIVES:

1. The instructor will project a number of slides of blood cells. The student will identify the cells by writing the names of those indicated. The exercise will be completed in the laboratory in ten minutes.

2. Given a list of blood cells the student will write the size, nuclear condition, and at least one function of each of the types. The exercise will be completed under test conditions in fifteen minutes.

3. Outside of class the student will write a paper on the mechanism of blood clotting. He will indicate all steps and substances involved in each step. The paper should be between 750 and 1000 words.

4. Using a model of the heart the instructure will indicate several membranes. The student will write the name of the membrane and list at least one function of each. The task will be completed under test conditiens and will take ten minutes.

5. On a fresh beef heart the instructor will indicate a number of parts to be identified by the student. The student will write the name of the parts indicated. The task will be completed in the laboratory under test conditions in twenty minutes.

6. Given a diagram of a cross section of the heart, the student will label the layers of the heart wall, the cavities and any other structures indicated. The task will be completed under test conditions in fifteen minutes.

7. Outside of class the student will write a paper of between 500 and 750 words on the contraction of the heart. Paper to include all stages of contraction from initial stimulation until blood is forced out of the left ventricle.

8. Given a diagram of structures involved in pulmonary circulatio n the student will insert sufficient arrows to indicate the flow of blood from the superior vena cava to the left ventricle. The task will be completed under test conditions in fifteen minutes .

9. Given a diagram of the circulatory system the student will insert arrows to show flow of blood from the left ventricle to the toe and back to the left ventricle. He will label all arteries through which the blood passes on the label lines. The task will be completed under test conditions in thirty minutes.

10. Given a cross section of a lymph vessel the student will label parts indicated. The task will be completed in the laboratory in five minutes.

11. Given a diagram of structures involved in fetal circulation the student will insert arrows to indicate blood flow. He will label all parts indicated by arrows. The task will be completed in the laboratory in twenty minutes.

12. Outside of class the student will write a paper on blood pressure. The paper will include factors affecting blood pressure; normal blood pressure limits; conditions causing elevated and reduced blood pressure. The paper will be between 500 and 750 words.

SPECIFIC OBJECTIVES:

1. The instructor will indicate a number of structures on the torso found in the respiratory system. The student will write the names of the parts indicated. The exercise will be completed in the laboratory in twenty minutes.

2. A number of parts will be pointed out by the instructor on a projected tissue slide ffrom the lung. The student will write the names of those parts indicated. The exercise will take ten minutes in the laboratory.

4. Given a list of parts of the respiratory system the student will list at least one function for each part indicated. The task will be completed under test conditions in twenty minutes.

5. Given a diagram of the thoracic cavity the student will label those parts indicated. The task will be completed under test conditions in fifteen minutes.

6. Given a diagram containing the respiratory and circulatory system the student will insert arrows to show the passage of air from the outside of the body through the systems of the body until it once again leaves the body. The student will complete the task under test conditions in thirty minutes.

7. Outside of class the student will write a paper between 1000 and 1500 words on the physiology of respiration. Items to be included are listed under Topic III of the Respiratory System, Chapter 10. Use any references you desire.

SPECIFIC OBJECTIVES:

1. Using the torse the instructor will indicate parts to be identified by the student. The student will write the names of the parts indicated. The task will be done under test conditions in fifteen minutes.

2. Given diagrams of several parts of the alimentary canal the student will identify the parts by writing their names. The task will be completed in the laboratory in thirty minutes.

3. Given a list of organs of the digestive system the student will give three functions of each in writing. The task will be completed under test conditions in twenty minutes.

4. The student will list the names and numbers of teeth found in a normal adult. He will do this under test conditions in ten minutes.

5. The student will write the names of salivary glands pointed out on the model by the instructor. The task will consume five minutes in class.

6. From a projected slide the student will identify tissues indicated by the instructor by writing their names. The task will take fifteen minutes in the laboratory.

7. Given a diagram of a section through the pancreas the student will label the parts indicated. He will in addition list the enzymes produced by the pancreas. The task will consume fifteen minutes under test conditions.

8. Outside of class the student will write a paper on the phenomenon of absorption as it applies to digestion. The paper will be between 500 and 800 words. Diagrams may be presented if the student feels they will enhance the presentation.

9. Given a list of foods to be consumed the student will indicate those processes that occur in each part of the digestive system. He will include the enzymes involved and the chemical substances resulting from digestion. The task is to be completed under test conditons in forty minutes.

10. Outside of class the student will write a paper of between 1000 and 1500 words on metabolism. Paper to include meaning, ways of expressing, basal metabolic rate and energy factors.

11. Under test conditions the student will give a one sentence definition of glucose; glycogenesis; glycogenolysis; gluconeogenesis; metabolism; catabolism; anabolism; absorption and phosphorylation. The task will take twenty minutes.

SPECIAL OBJECTIVES:

1. Using the torso the instructor will point out a number of parts of the urinary system. The student will write the names of the parts indicated under test conditions. The task will take fifteen minutes.

2. Using a model of the internal structure of the kidney the student will write the names of parts indicated by the instructor under test conditions. The exercise will take twenty minutes.

3. From a projected tissue slide of the kidney the student will write the names of parts pointed out by the instructor. The task will take place under test conditions in twenty minutes.

4. Outside of class the student will write a paper of between 850 and 1100 words on the physiology of the kidney. The paper will include functions; how urine is excreted; volume of urine and mechanisms controlling volume; influences of urine excretion and blood pressure.

5. Under test conditions the student will list the compenents of urines and give percentages of each component. The task will be completed under test conditions in twenty minutes.

6. Under test conditions the student will write a one sentence definition of the following words: calculi; casts; cystitis; nephritis; oliguria; hematuria; glycosuria; pyelitis; ptosis. Fifteen minutes will be allowed to complete the task.

SPECIFIC OBJECTIVES:

1. Given a diagram of the male reproductive system the student will label parts indicated. The task will be completed in the laboratory in twenty minutes.

2. Given a list of structures which make up the male reproductive system the student will list at least one function of each part. The task will be completed in the laboratory in ten minutes.

3. Given a diagram of a longitudinal section through the testis the student will label all parts indicated. He will then give at least one function of each part. The taak will be completed in the laboratory in fifteen minutes.

4. Given a diagram of the male reproductive dystem the student will insert arrows to show the route taken by the spermatozoa from production until they leave the body. He will write the names of the fluids produced by the several glands as indicated on the drawing. The taak will be completed under test conditions in fifteen minutes.

5. Given a diagram of the female reproductive system the student will label all parts indicated. The task will be completed under test conditions in fifteen minutes.

6. Given a diagram of the female reproductive system the student will insert arrows to show the route of an ovum from production until it leaves the female body. The task will be completed under test conditions in fifteen minutes.

SPECIFIC OBJECTIVES:

1. Given a diagram of the endocrine system the student will label all structures indicated. The task will be completed under test conditions in twenty minutes.

2. Given a list of endocrine glands the students will list all hormones sevreted by the glands. The task will be completed in the laboratory in twenty minutes.

3. Given a list of hormones the student will give all functions of the hormones under test conditions. The task will be completed in twenty-five minutes.

4. A number of tissue slides of endocrine glands will be projected. The student will identify tissues peintdd out by the instructor. The task will be completed in the laboratory in fifteen minutes.

5. The student will write a paper of between 500 and 850 words under test conditions on the relationship between the anterior hypophysis and the female reproductive structures. Name pertinent structures, hormones secreted and actions of the several hormones.

SPECIFIC OBJECTIVES:

1. Under test conditions the student will list ways that water enters and leaves the human body. The task will take fifteen minutes.

2. The student will read the Chapter on fluid and electrolyte balance outside of class. No specific written exercise is to be accomplished.

SPECIFIC OBJECTIVES:

1. The student will read the Chapter on Acid-base balance outside of class.